



C2195 Reliability Validation Test Plan

Wiwynn Updated

Feb. 15th, 2022

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C2195 Reliability Validation

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Reliability Test Plan

Reference specification

M1071141 Rev E WCS HW Reliability Specification
Hardware: WCS and Non-WCS Systems Specification



RE_ Narrow latch re qual at EV2.msg

■ Sample allocation by EV2 stage

		EV2	EV2	EV2	EV2	EV2
Baseline test on all samples (Pre-conditioning)		MaxA1 (main)	MaxA2 (2nd)	B1 (32coreMain)	B2 (32core2nd)	MB with narrow latch
Environmental (ESS - Enviromental Stress Screening)						
Non-Operational - Thermal Cycling - Deformation (Robustness)	EV	1	1 => 0	0	1	1 (with narrow MB#1)
Non-operation - High Temperature/Humidity (STORAGE) - 85/85	EV	1	1 => 0	1	1	1 (with narrow MB#2)
Non-Operational Cold & Hot Storage (-40/70°C)	EV	1	1 => 0	2	2	1 (with narrow MB#3)
Thermal profile (IR hot spots & thermo-couple temp measurements)	EV	1 => 0			1	1 (with narrow MB#4)
Electrical - HALT / Biased Power Cycling						
Operational HALT: Temperature stepping up/down to failure (Margin)	EV	1		1	1	
Operational HALT: Vibration stepping up/down to failure (Margin)	EV	1	1		1	
Operational HALT: Combined temperature & vibration change	EV		1 => 0	1	1	1 (with narrow MB#5)
Four-corner voltage/temperature (Margin)	EV	1	1 => 0	1		1 (with narrow MB#6)
Operational and non-operational Altitude tests - (Margin)	EV		1 => 0	2		1 (with narrow MB#4)
Operation - High Temperature/Humidity w/AC power cycling (RDT/DMTBF)	EV	1	1	1		
Mechanical Stresses						
Non-Operating Shock, non-packaged (board level /L10)	EV			2	1	
Non-Operating vibe, non-packaged (board level /L10)	EV			2	1	
Connector durability	EV			1	1 => 0	1 (with narrow MB#3)
High Speed Cable Requirements	EV			(1)	(1)	



Reliability Test Plan

■ Sample arrival status

Date	SKU - A1	SKU - A2	SKU - B1	SKU - B2
2022/01/28	2	1	4	4
2022/02/15	-	-	3	3
Total	2	1	7	7

Remark: Based on PM's update, they would try to provide all samples before end of 2/18 for reliability test.



Reliability Test Plan

- All yellow bang device were from AMD vendor.

Microsoft Hardware Error Device
Microsoft System Management BIOS Driver
Microsoft UEFI-Compliant System
Microsoft Virtual Drive Enumerator
Microsoft Windows Management Interface
NDIS Virtual Network Adapter Enumerator
PCI Express Root Complex
PCI Express Root Complex
PCI Express Root Complex
PCI Express Root Complex
PCI Express Root Complex Event Collector
PCI Express Root Complex Event Collector
PCI Express Root Complex Event Collector
PCI Express Root Complex Event Collector
PCI Express Root Port
PCI Express Root Port

PCI Express Root Complex Event Collector Properties

General Driver Details Events Resources

PCI Express Root Complex Event

Property: Hardware Ids

Value:

- PCI\VEN_1022&DEV_14A6&SUBSYS_14C81022&REV_00
- PCI\VEN_1022&DEV_14A6&SUBSYS_14C81022
- PCI\VEN_1022&DEV_14A6&CC_080700
- PCI\VEN_1022&DEV_14A6&CC_0807

Other devices:

- Base System Device
- Base System Device
- Base System Device
- Base System Device
- PCI Device
- PCI Device
- PCI Device
- PCI Device
- PCI Device
- PCI Encryption/Decryption Controller
- PCI Encryption/Decryption Controller
- SM Bus Controller
- Unknown device
- Unknown device
- Unknown device
- Unknown device
- Unknown device
- Unknown device
- Unknown device
- Unknown device
- Unknown device

Base System Device Properties

General Driver Details Events Resources

Base System Device

Property: Hardware Ids

Value:

- PCI\VEN_1022&DEV_14C8&SUBSYS_14C81022&REV_00
- PCI\VEN_1022&DEV_14C8&SUBSYS_14C81022
- PCI\VEN_1022&DEV_14C8&CC_088000
- PCI\VEN_1022&DEV_14C8&CC_0880

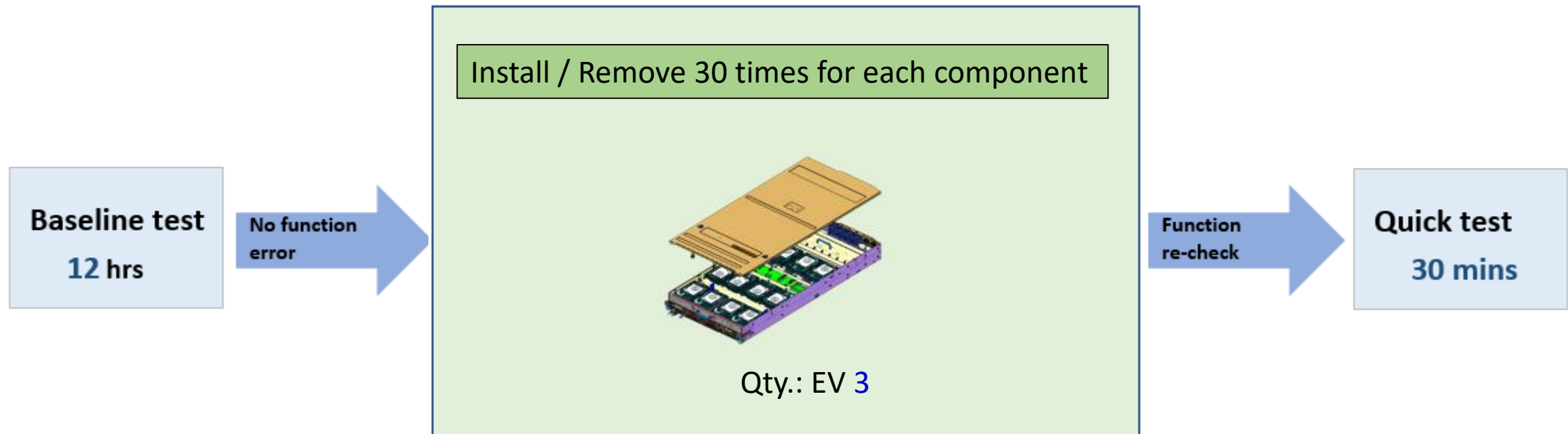


Connector Durability

Test Item	Description / Test Condition
Connector Durability	Follow connector list to do connector insertion and extraction 30 times each.

Connector Durability

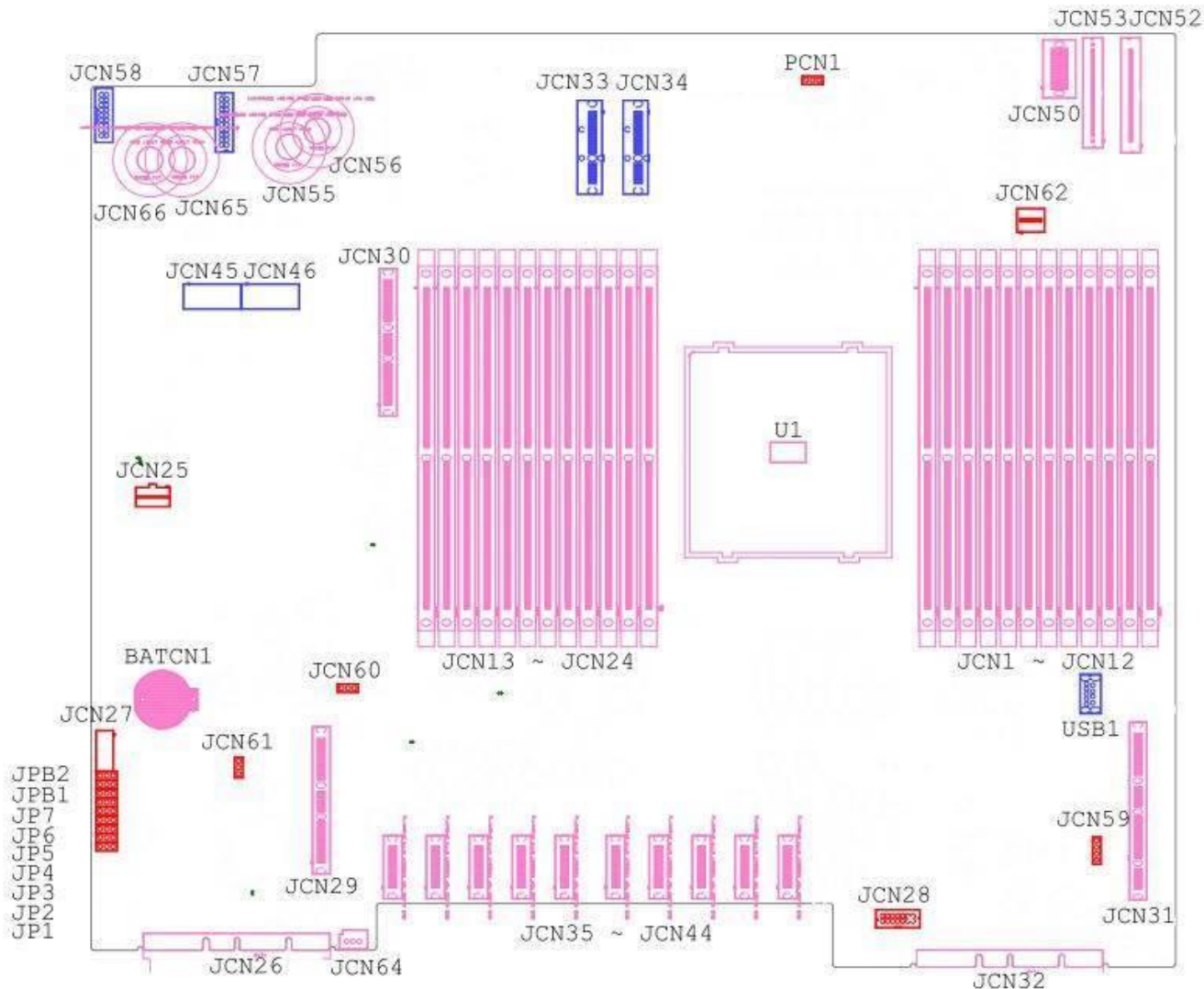
(Non-Op Test, L10 level)





Connector Durability

Test cover all connectors.



Note:

1. Pink: New
2. Blue: Leverage C2080
3. Red: Debug use

New part function introduction:

1. JCN55, JCN56, JCN65, JCN66
-> Rapid lock (PSU power connector)
2. JCN50
-> 12V power connector for 2U PDB
3. JCN53
-> 1U/2U singal rotor fan connector
4. JCN52
-> 1U dual rotor fan connector
5. JCN29, JCN30
-> 4C 140P connector for PCIe x16
6. JCN31
-> 4C+ 168P connector for PCIe x16
7. BATCN1
-> Battery holder
8. JCN1 ~ JCN24
-> DDR5 DIMM socket
9. U1
-> SP5 CPU socket
10. JCN35 ~ JCN44
-> 1C 56P connector for EDSFF x4
11. JCN26, JCN32
-> 4C+ 168P connector for SCM, OCP NIC
12. JCN64
-> Intrusion header

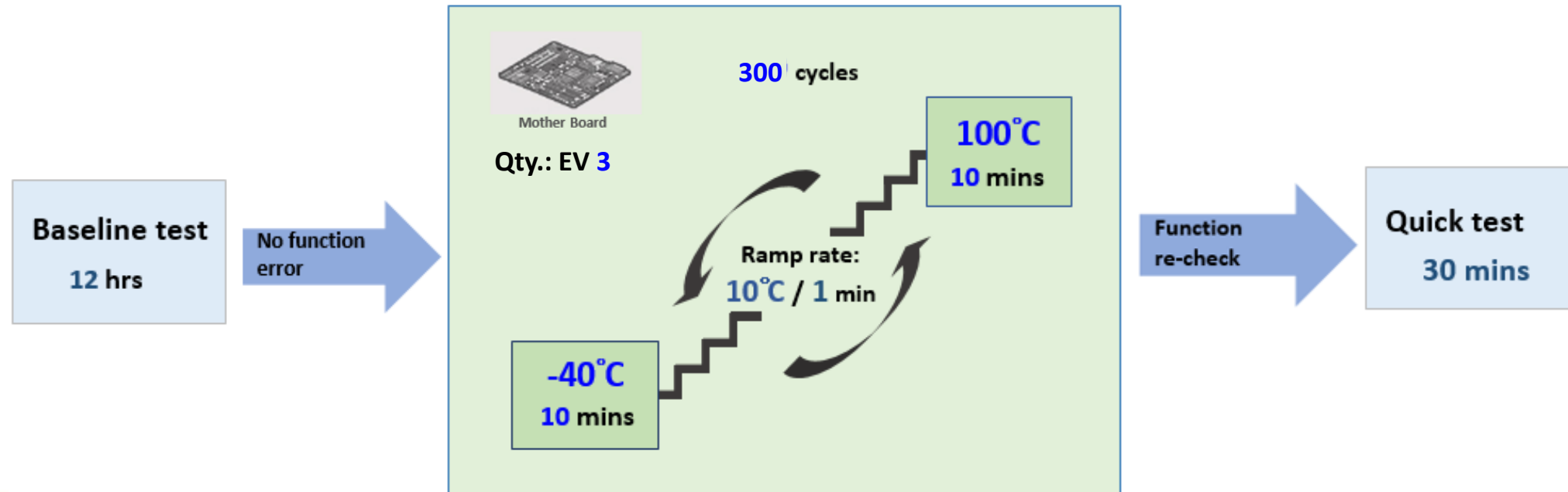


Thermal Cycling

Test Item	Description/ Test Condition
Thermal Cycling (non-operating) Ref: JESD22-A104 JESD22-A106	<p>Thermal cycling from -40°C to 100°C. Ramp rate: 10°C/min. Soaking at each temperature extreme for a minimum 10min or until thermal equilibrium is reached. Total 300 cycles</p> <ol style="list-style-type: none">1. Functional test at room temperature.2. Dye and Pry and/or cross section critical components at the end of the test.

Thermal Cycling


(non-operational & PCBA level)





Thermal Cycling – DnP location

DNP Locations



Name	Location	Chip Size (mm)
CPU	U1	73.62 * 68.62
CPLD	U8	19 * 19
Retimer #1	U83	8.9 * 22.8
Retimer #2	U80	8.5 * 13.4

Follow standard - IPC-9704:

3.2.1 Area Array Components It is recommended that any area array device with a package body size equal to or larger than 27 x 27 mm or finer pitch components (0.8 mm pitch and below) with body size > 10 mm should be evaluated. If there are several fine pitch components, then, at a minimum, the three worst case locations should be tested based on engineering judgment, history of damage, or finite element analysis.

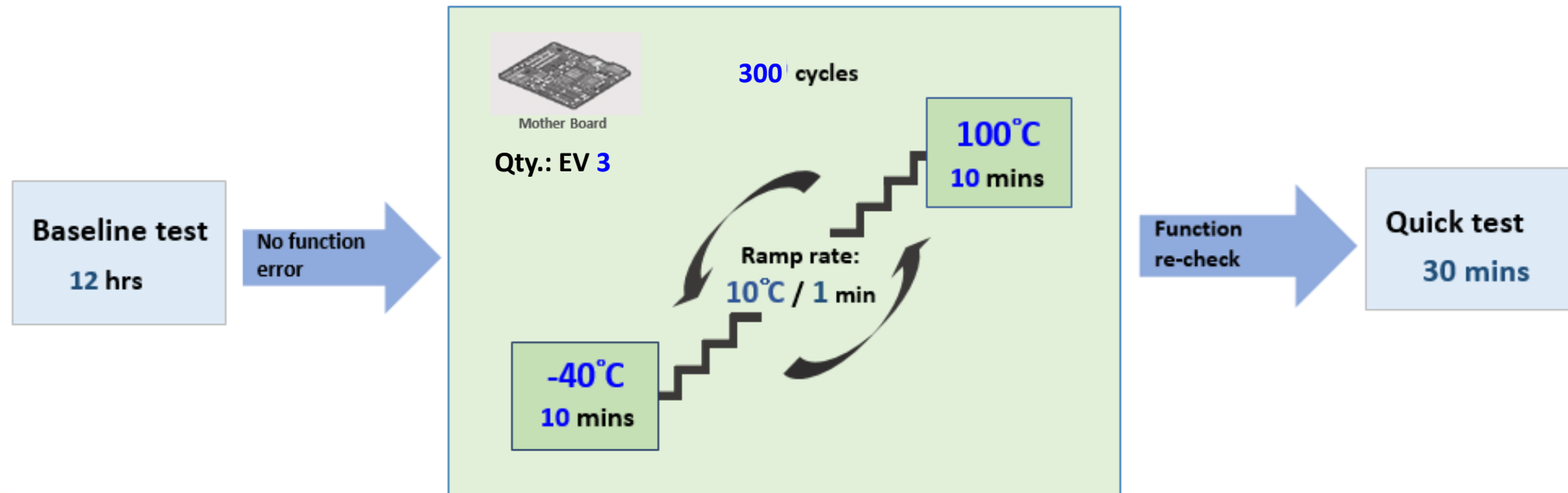


Thermal Cycling

Test Item	Description/ Test Condition
Thermal Cycling (non-operating) Ref: JESD22-A104 JESD22-A106	<p>Thermal cycling from -40°C to 100°C. Ramp rate: 10°C/min. Soaking at each temperature extreme for a minimum 10min or until thermal equilibrium is reached. Total 300 cycles</p> <ol style="list-style-type: none">1. Functional test at room temperature.2. Dye and Pry and/or cross section critical components at the end of the test.

Thermal Cycling

(non-operational & PCBA level)





High Temperature / Humidity (Storage) - 85/85

Test Item	Description/ Test Condition
Storage (non-operational): High Temperature/ Humidity Ref: JESD22-A103	85°C / 85%RH for 500hrs for connectors. Follow proper temperature and humidity ramping procedures to avoid condensation on Device under test (DUT)

Storage High Temperature/Humidity (non-operational & PCBA level)



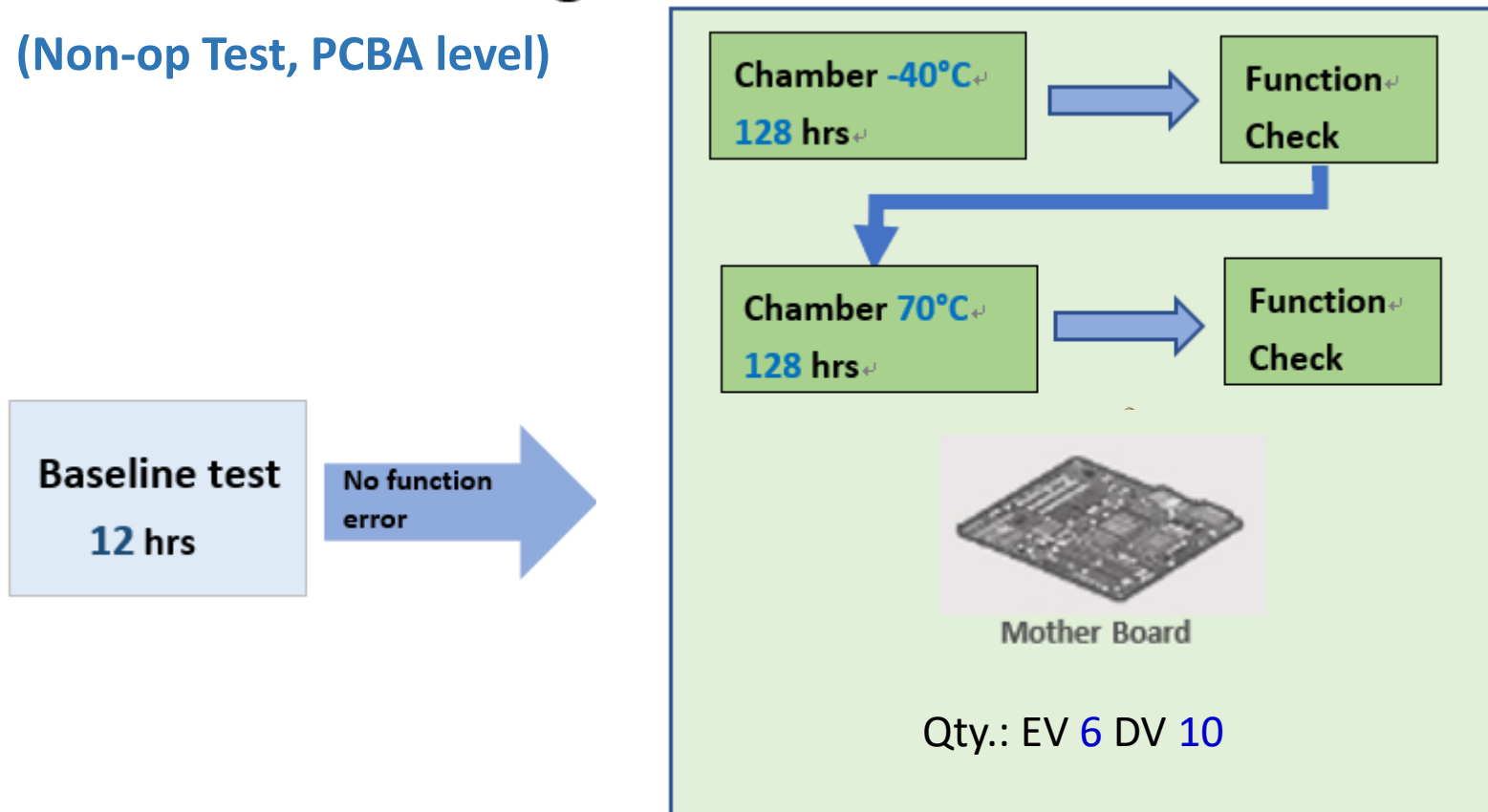


Cold and Hot Storage

Test Item	Description / Test Condition
Cold and hot storage (Ref. JEDEC JESD22-A119)	1. Cold and hot temp. for a minimum of 128hrs at each temp. 2. Test temperature: -40°C and 70°C

Cold and hot storage

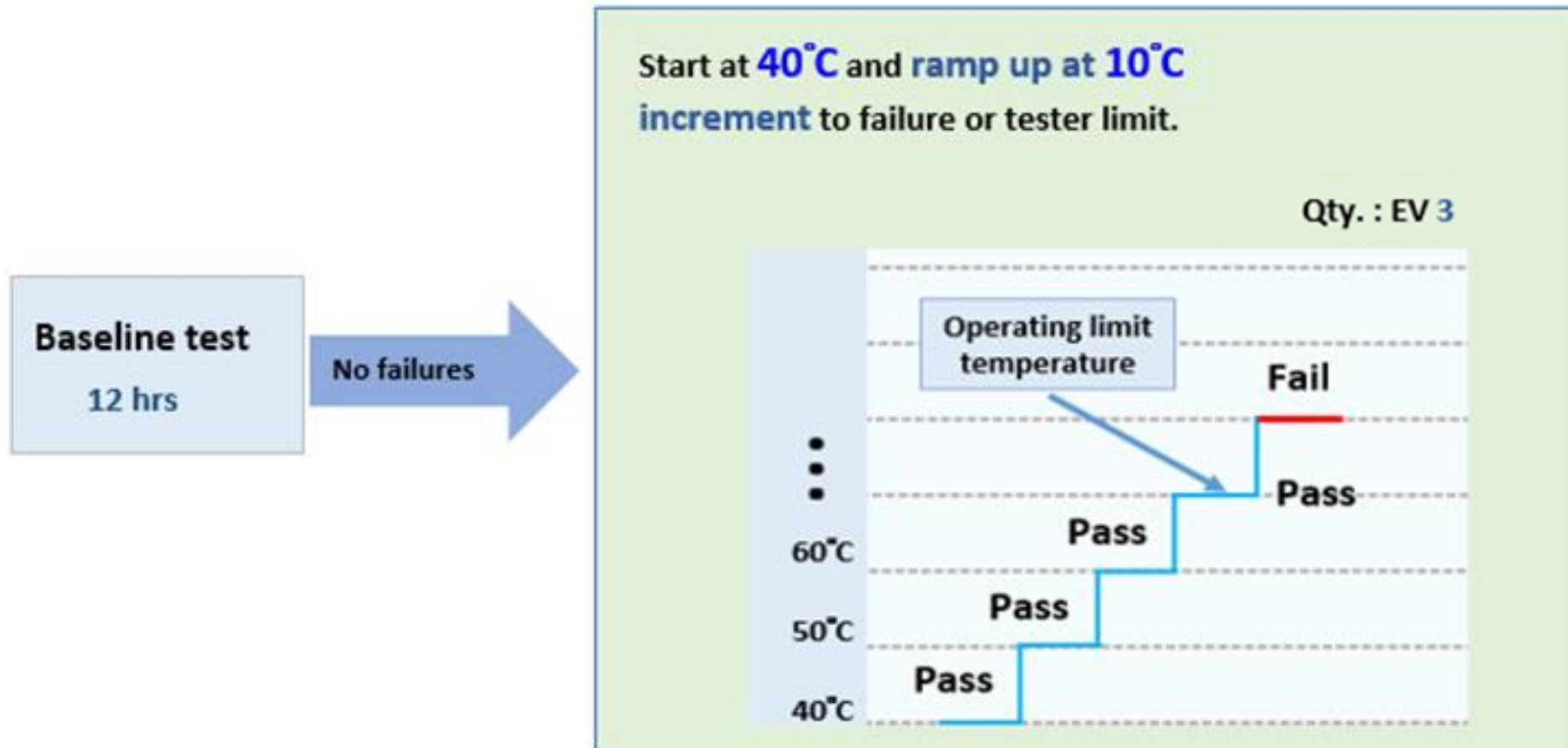
(Non-op Test, PCBA level)





HALT (UOL)

Test Item	Description/ Test Condition
Operational HALT: Upper Operational Limit (UOL)	Start at 40°C and ramp up at 10°C increment to failure or tester limit.



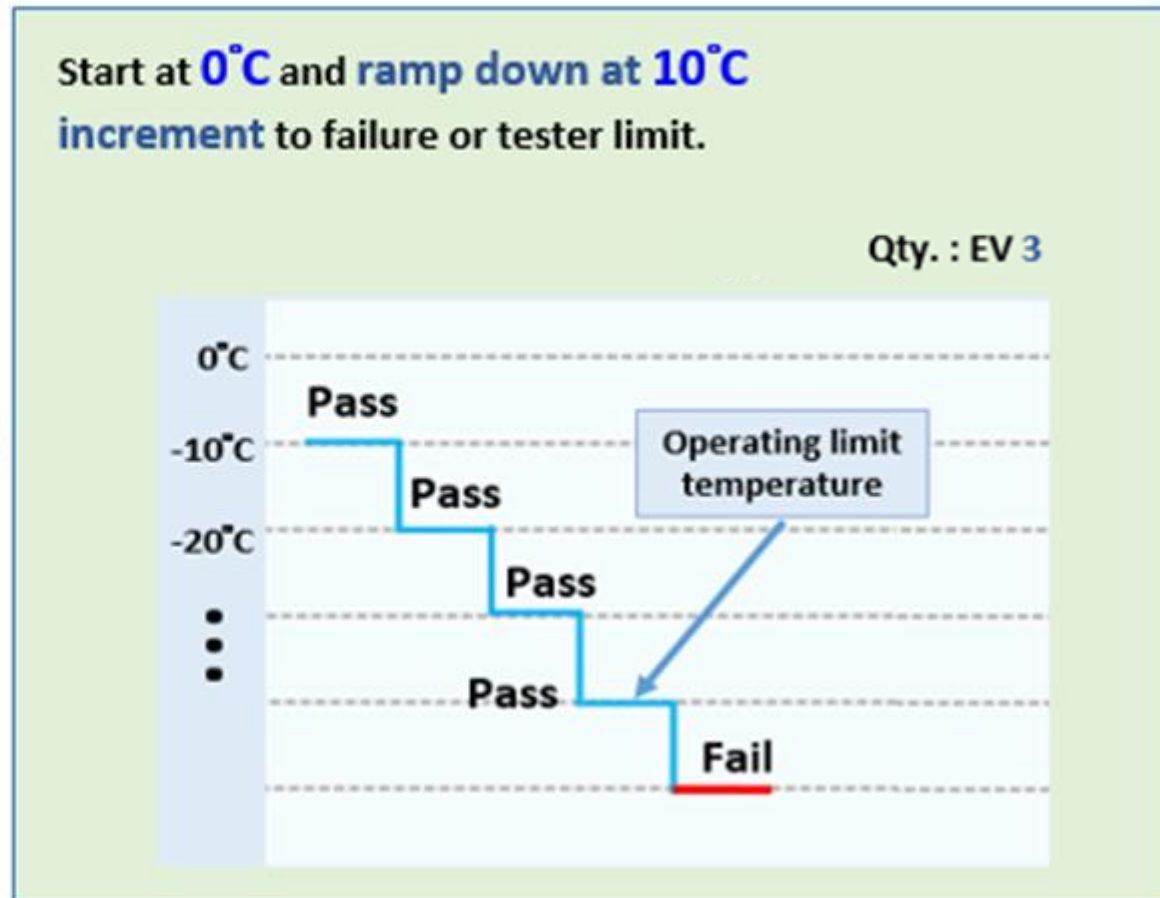


HALT (LOL)

Test Item	Description/ Test Condition
Operational HALT: Lower Operational Limit (LOL)	Start at 0°C and ramp down at 10°C increment to failure or tester limit.

Baseline test
12 hrs

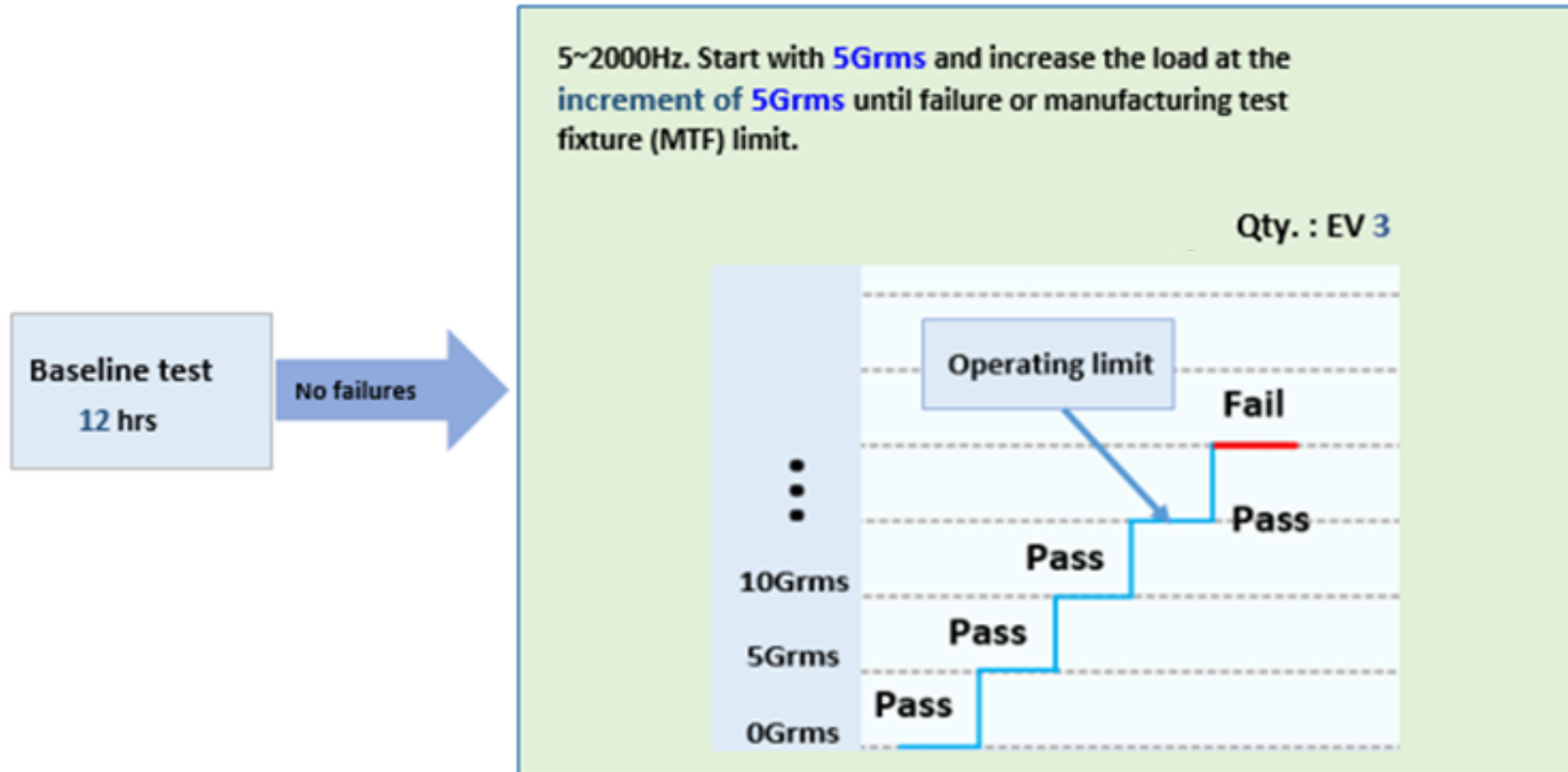
No failures





HALT (VOL)

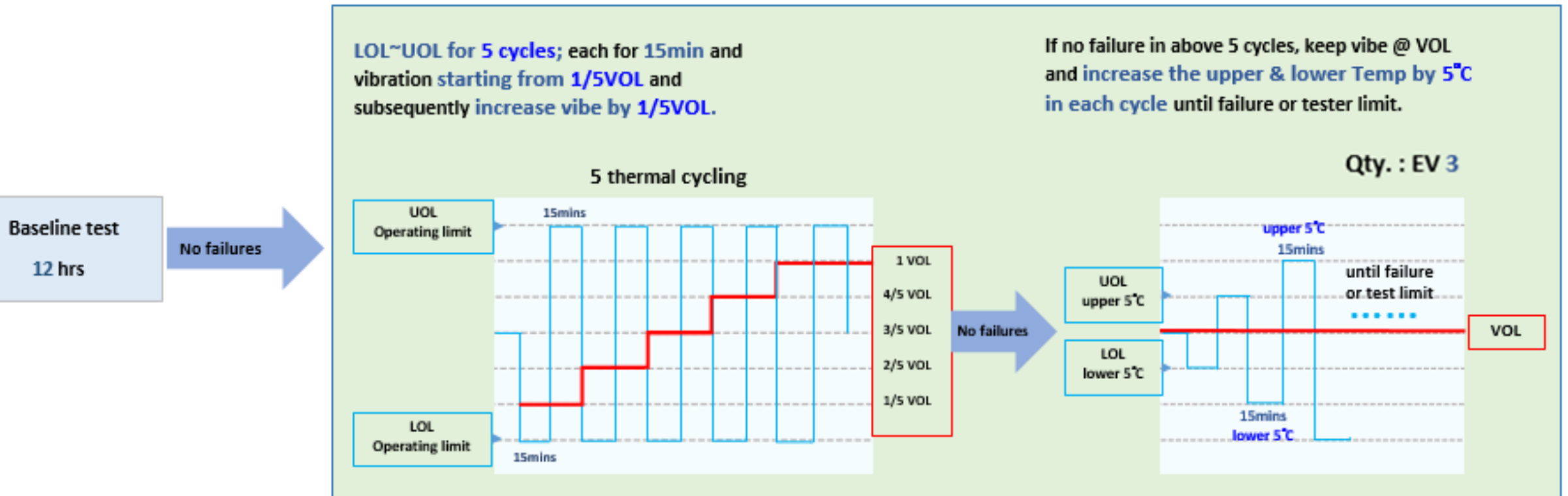
Test Item	Description/ Test Condition
Operational HALT: Vibration Operational Limit (VOL)	5~2000Hz. Start with 5Grms and increase the load at the increment of 5Grms until failure or manufacturing test fixture (MTF) limit.





HALT (Combined)

Test Item	Description/ Test Condition
Operational HALT: Combined temperature & vibration change	<ol style="list-style-type: none">1. LOL~UOL for 5 cycles; dwell at LOL and UOL for 15min and vibration starting from 0.2VOL @ 1st cycle and subsequently increase vibe by 0.2VOL.2. If no failure in above 5 cycles, keep vibe @ VOL and increase the upper & lower Temp by 5°C in each cycle until failure or tester limit.



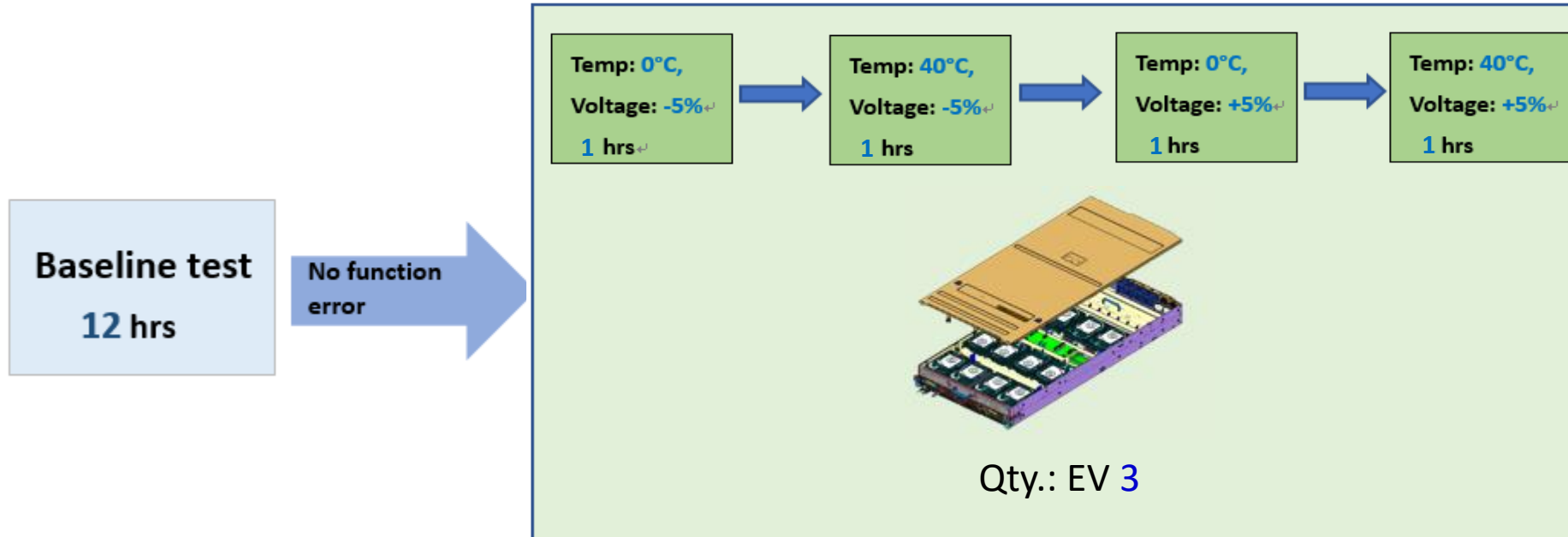


Four Corner

Test Item	Description / Test Condition
Four-corner voltage/temp (margin)	To ensure motherboard work normally at high & low temperature (0°C , 40°C) and $\pm 5\%$ voltage bias limit.

Four-corner voltage/temp (margin)

(Operational Test, L10 level)

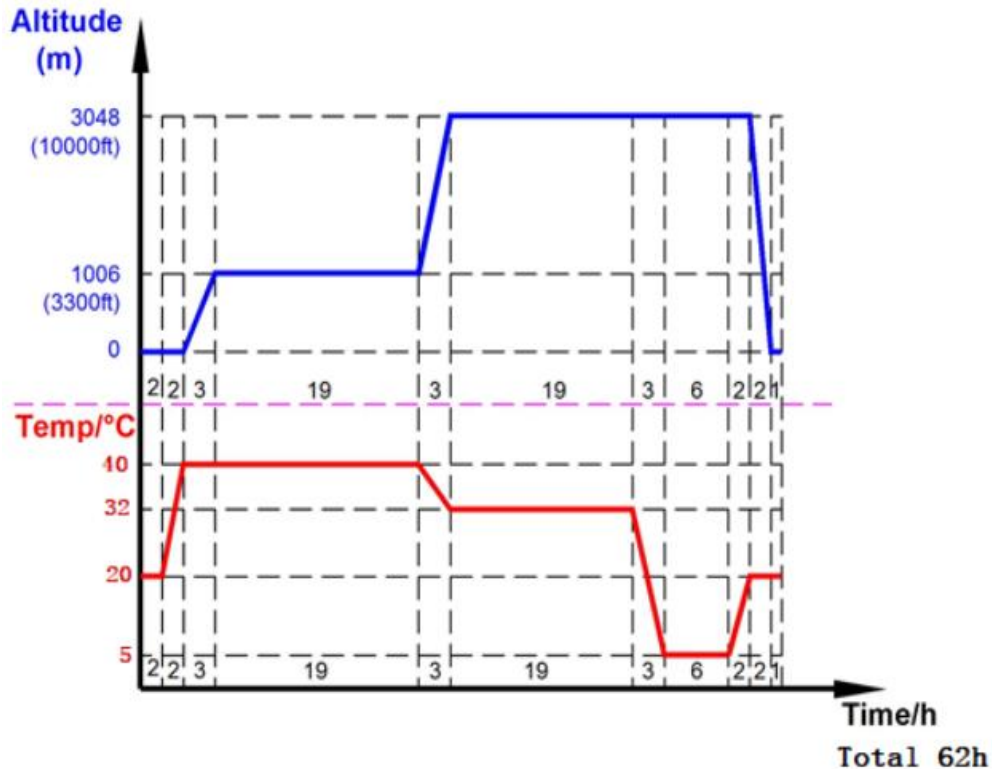




Operational and Non-operational Altitude Tests

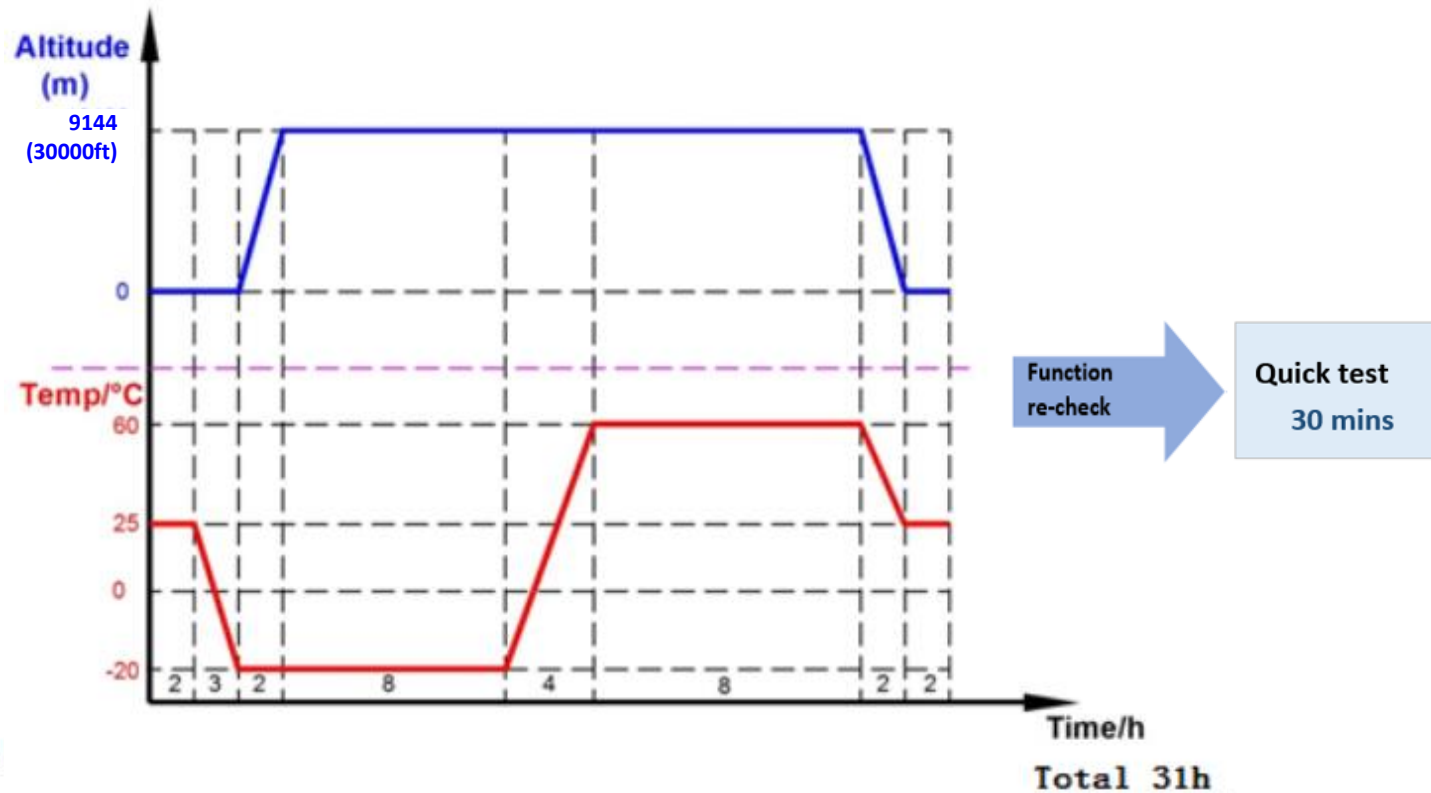
Test Item	Description / Test Condition
Operational and Non-operational Altitude Tests (Ref. IEC68-2-13/40/41)	<ol style="list-style-type: none">1. Operating – 3,300 ft & 10,000 ft maximum with 5°C, 32°C and 40°C2. Non-operating – 30,000 ft maximum with -20°C and 60°C3. Rate of change less than 1500 ft./min (457m/min)

Operating Altitude Test



Non-Operating Altitude Test

Qty.: EV 3

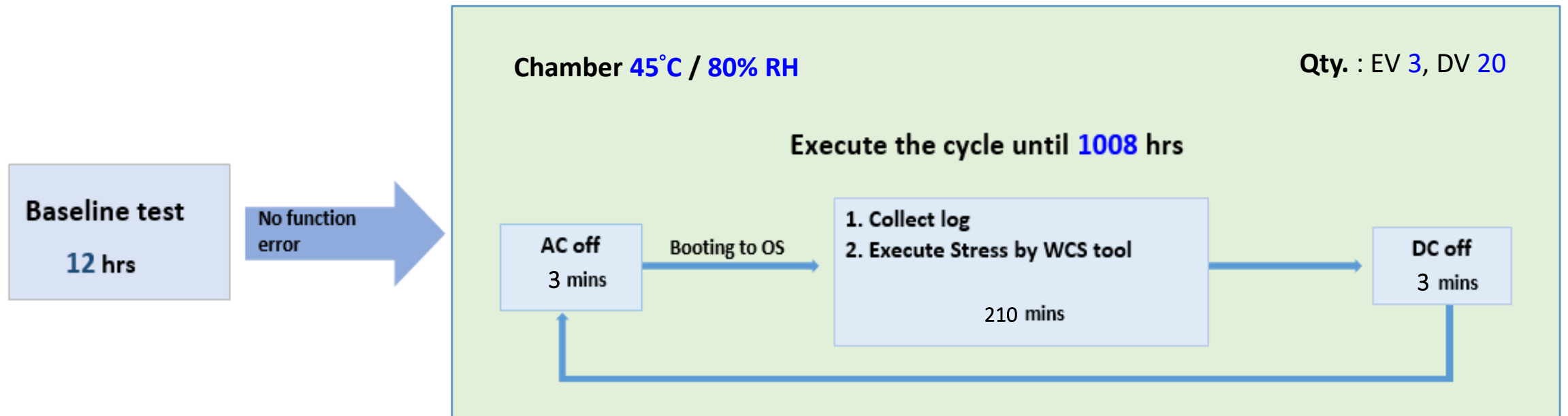




RDT – Reliability Demonstration Test

Test Item	Description / Test Condition
RDT (Ref. JESD22-A101/102)	45°C/80%RH @ nominal power input & max. workload for 1008hrs

Operational High Temperature/Humidity with AC Power Cycling (RDT)





Thanks



Back Up